QUinoa SEED QUALITY AND SENSory EVALUATION

Abstract

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Quinoa is a grain that has garnered increasing interest in recent years from global markets, as well as in academic research. The studies in this dissertation focused on quinoa seed quality and sensory evaluation among diverse quinoa varieties potentially adaptive to Washington State growing conditions. The objectives in the dissertation were to study quinoa seed quality, as well as the sensory attributes of cooked quinoa as defined by both trained and consumer panelists. Regarding quinoa seed quality, we investigated seed characteristics (diameter, weight, density, hardness, seed coat proportion), seed composition (protein and ash content), flour viscosity and thermal properties, quinoa cooking quality, and texture of cooked quinoa. Additionally, the functional characteristics of quinoa were studied, including the determination of amylose content, starch swelling power and water solubility, texture of starch gel, and starch thermal properties. Results indicated texture of cooked quinoa was significantly influenced by protein content, flour viscosity, quinoa cooking quality, amylose content, and starch enthalpy. In addition, the influences of growing conditions, specifically soil salinity, on quinoa seed quality were evaluated and the variety ‘QQ065’ was the best adapted varieties under NaCl and Na₂SO₄ influenced soil. Finally, sensory evaluation studies on cooked quinoa were conducted. A lexicon of cooked quinoa was developed including the sensory attributes of aroma, taste/flavor, texture, and color. Using the lexicon, the trained panel evaluated 21 quinoa varieties
and a consumer panel evaluated their acceptance of six selected quinoa samples. Results from
the trained and consumer panel indicated that consumer liking of quinoa was positively
influenced by grassy aroma, and firm and crunchy texture. Generally, these results represent
valuable information to quinoa breeders in the determination of seed quality of diverse quinoa
varieties. In the food industry, the results of seed quality and sensory studies (lexicon and
consumer-liking) can be utilized to evaluate quinoa ingredients from multiple locations or years,
determine the efficiency of post-harvest processing, and develop appropriate products according
to the properties of the specific quinoa variety. Overall, this dissertation contributed to the
growing body of research describing the chemical, physical and sensory properties of quinoa.